Name: Date:

Polynomial Factoring solution (version 31)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-108}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{12 \pm 6\sqrt{3}\, i}{2}$$

$$x = 6 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 7i$ and $8 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 7i) \cdot (8 - 6i)$$

$$-16 + 12i + 56i - 42i^2$$

$$-16 + 12i + 56i + 42$$

$$-16 + 42 + 12i + 56i$$

$$26 + 68i$$

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3. **Write function $f(x) = x^3 - 6x^2 - x + 6$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-6	-1	6
1		1	-5	-6
	1	-5	-6	0

$$f(x) = (x-1)(x^2 - 5x - 6)$$

$$f(x) = (x-1)(x-6)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x+1)^2 \cdot (x-2) \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.